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10/774,263	02/06/2004	Juha Sarkijarvi	042933/272747	8675

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ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER	
ANYIKIRE, CHIKAODILI E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/774,263	SARKIJARVI ET AL.	
	Examiner	Art Unit	
	Chikaodili E. Anyikire	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) *13-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 21-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on December 03, 2007 have been fully considered but they are not persuasive. Claims 1-12 and 21-51 are currently pending.

2. The applicant argues that the reference does not teach selectively downsampling a first direction or second direction. The examiner disagrees. The reference teaches the adaptive first and/or second direction as well as upsampling (Vetro; Col 13 Ln 15-30).

3. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Since Vetro et al (US 7,170,932) teach the applicant's argument's the combination of Boyce et al (US 5,635,985) and Jeng et al.

A detailed description of the newly amended claims follows.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

> applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-2, 6, 18, 25-26, 30, 37-38, and 42 are rejected under 35 U.S.C. 102(e) as being anticipated by Vetro et al (US 7, 170, 932).

As per claims 1, 25, and 37, Vetro et al discloses a transcoder, system, method, and computer program for transcoding data comprising a group of macroblocks representing a frame of data, the transcoder comprising:

a decoder (Fig 17, 1703) configured to decode input data to thereby generate prediction error and decoded image data in a spatial domain, the input data comprising a group of macroblocks representing a frame of data (Col 17 Ln 66- Col 18 Ln 12);

a downsampler (Fig 17, 1750) configured to selectively downsample one of the prediction error or the decoded image data in at least one of a first direction or a second direction different than the first direction to generate a downsampled macroblock in the spatial domain (Col 18 Ln 13-31; frames downsampling is performed in both row and column direction of the frames); and

an encoder (Fig 17, 1704) configured to encode the downsampled macroblock into output data (Col 18 Ln 14-20).

As per claims 2, 26, and 38, Vetro et al discloses a transcoder, system, method, and computer program according to claim 1, 13, 25, and 37, wherein the decoder comprises:

a variable-length decoder (Fig 17, 1710) configured to variable-length decoding input data to generate quantized Discrete Cosine Transform (DCT) coefficients;

an inverse quantizer (Fig 17, 1720) configured to inverse quantizing the quantized DCT coefficients to generate DCT coefficients;

an inverse DCT-coder (Fig 17, 1730) configured to inverse DCT-coding the DCT coefficients to generate the prediction error in the spatial domain (Col 18 Ln 4-13); and

a summing element (Fig 17, 1780) configured to summing the residual blocks and motion compensation data to generate the decoded image data (Col 18 Ln 4-13).

As per claims 6, 30, and 42, Vetro et al discloses a transcoder, system, method, and computer program according to claim 1, 13, 25, and 37, wherein the encoder comprises:

a Discrete Cosine Transform (DCT)-coder (Fig 17, 1783) configured to DCT-code the downsampled macroblock into DCT coefficients in a DCT domain (Col 18 Ln 31-35);

a quantizer (Fig 17, 1784) configured to quantizing the DCT coefficients (Col 18 Ln 31-35); and

a variable-length encoder (Fig 17, 1786) configured to variable-length coding the DCT coefficients into output data (Col 18 Ln 31-35).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 3-5, 7, 9-12, 15-17, 19, 21-24, 27-29, 31, 33-36, 39-41, 43, and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro et al (US 7,170,932) in further view of Boyce et al (US 5,635,985).

As per claims 3, 27, and 39, Vetro et al discloses a transcoder, system, method, and computer program according to claim 1, 13, 25, and 37, wherein the decoder (Fig 17, 1703).

However, Vetro et al does not explicitly teach a decoder configured to decode the input data at a reduced resolution.

In the same field of endeavor, Boyce et al teaches an HD/SD television decoder wherein the decoder is configured to decode the input data at a reduced resolution (Fig 2B, decoder 300).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the decoder of Vetro et al to incorporate further features of the decoder of Boyce et al to provide the functionality of reduced resolution decoding. The advantage of modifying Vetro et al with the features of Boyce et al decoder is to provide a method and system that provides a quicker and efficient way of reducing the resolution of media data, thereby reducing the load on computational resources.

As per claims 4, 28, and 40, Boyce et al discloses an HD/SD television decoder according to claim 3, 15, 27, and 39, wherein the decoder (Figs 1-3, 100-300) is configured to decode the input data (Col 14 Ln 59- Col 15 Ln 9) further including downsampling the input data, including the prediction error and the decoded image data, in the first direction, and wherein the downsampler is capable of downsampling one of the prediction error and the decoded image data in the second direction in the spatial domain (Col 10 Ln 39-62; it is well known in the art that a downsampler functions in multiple directions specifically a vertical and horizontal direction and it can be seen from Fig 1-3 that a prediction error and decoded image is used at the input of the downsampler).

As per claims 5, 29, and 41, Vetro et al discloses a transcoder, system, method, and computer program according to claim 1, 13, 25, 37, and 46, further comprising:

However, Vetro et al does not explicitly teach an intra/inter selector capable of determining to pass to the downsampler and encoder one of the prediction error and the

decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

In the same field of endeavor, Boyce et al teaches, mode selector 129 determines, for each output macroblock, whether the macroblock is characterized as either a first or a second coding type. The first coding type is commonly referred to as "inter" while the second coding type is commonly referred to as "intra." An inter-macroblock (characterized as the first coding type) is dependent on the content of another macroblock. That is, an inter-macroblock is a predicted macroblock that is derived from another macroblock using motion information. An intra-macroblock (characterized as the second coding type) is independent of the content of another macroblock and does not contain any motion information (Col 10 Ln 39-62).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the transcoder of Vetro et al to include the mode selector of Boyce et al. The advantage of the mode selector of Boyce et al is that it controls the amount of error and compression rate by choosing between an intra or inter marcoblock.

As per claims 7, 31, and 43, Vetro et al discloses a transcoder, system, method, and computer program according to claim 1, 13, 25, and 37, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples (Col 18 Ln 4-5; frames are part of image that are made of pixels and pixels lines), and wherein the

downsampler (Fig 17, 1750) being configured to downsample one of the prediction error and the decoded image data in the second direction (Col 18 Ln 13-30).

However, Vetro et al does not explicitly teach by skipping one of a top and a bottom field of the frame of data when the data comprises interlaced data, and includes being configured to one of skip every other sample line of the frame of data when the data comprises non-interlaced data.

In the same field of endeavor, Boyce et al teaches MPEG permits the portion of an image corresponding to a macroblock to be encoded either on an interlaced or non-interlaced manner. Macroblocks corresponding to non-interlaced pictures are always coded using a frame DCT format and with macroblocks corresponding to interlaced pictures being coded using either a field or frame DCT format. Downsampling of macroblocks corresponding to non-interlaced pictures is performed by the downsampler 126 on a frame basis.

However, with regard to macroblocks corresponding to interlaced pictures downsampling can be performed on either a field of frame basis for each macroblock. Accordingly, in one embodiment both interlaced and non-interlaced pictures are downsampled on a frame basis. While in another embodiment non-interlaced pictures are downsampled on a frame basis while interlaced pictures are downsampled on a field basis (Col 12 Ln 49 – Col 13 Ln 47).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the transcoder of Vetro et al to include the

decoder of Boyce et al. The decoder having the capability of both interlace and non-interlace downsampling with resolution. The advantage of Boyce et al being during field based downsampling preserves the greatest degree of temporal resolution whereas frame based downsampling has the potential of preserving the greatest degree of spatial resolution.

As per claims 9, 21, 33, and 45, arguments analogous to those presented for rejection of claims 1 and 3 are applicable to claims 9, 21, 33, 45.

As per claims 10, 22, 34, and 46, arguments analogous to those presented for the rejection of claim 4 is applicable to claims 10, 22, 34, and 46.

As per claims 11, 23, 35, 47, arguments analogous to those presented for claim 5 are applicable to claims 11, 23, 35, and 47.

As per claims 12, 24, 36, and 48, Vetro et al discloses a transcoder, system, method, and computer program according to claim 9, 21, 33, and 45, further comprising:

a mixed block processor (Fig 13, 1300) capable of converting at least one of the macroblocks of the decoded image data from a first coding mode to a second coding mode before the downsampler downsamples the decoded image data (Col 10 Ln 40-Col 11 Ln 20).

9. Claims 8, 32, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro et al (US 7, 170, 932) in further view of Jeng et al.

As per claims 8, 20, 32, and 44, Vetro et al discloses a transcoder, system, method, and computer program according to claim 1, 13, 25, and 37, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples (Col 18 Ln 4-5; frames are part of image that are made of pixels and pixels lines), and wherein the downsampler (Fig 17, 1750) is capable of downsampling one of the prediction error and the decoded image data in the first direction (Col 18 Ln 13-30).

However, Vetro et al does not explicitly teach by one of skipping every other sample of each sample line of the frame of data and averaging every pair of neighboring samples of each sample line.

In the same field of endeavor, Jeng et al teaches to improve signal processing performance, pixel averaging and/or omitting scheme is used, particularly to conserve DRAM bandwidth and traffic associated with calculating predictive vector values for complete video screen pel samples. Averaging module 87 optionally generates "pixel-averaged" signal 100 for SDRAM 2 in three cases, as illustrated in FIGS. 11A, 11B and 12. In particular, summed signal 99 may be processed by calculating signal 100 as follows:

(1) Referring to FIG. 11A, average values 215 for each sequential horizontally-neighboring pel pairs 214 of particular motion vector values associated with each such horizontally-neighboring pel pair. In this way, since every two pels are combined into one pel, total computations are effectively reduced by half.

(2) Referring to FIG. 11B, average values 215 for every other alternating horizontally-neighboring pel pairs 214 of particular motion vector values associated with such every other horizontally-neighboring pel pair, and effectively disregarding, to reduce computational activity, average values of those every other neighboring pel pairs 216 that are not calculated.

(3) Referring to FIG. 12, for each pel of every other vertically-neighboring pel pair 217 a motion vector value associated with each pel of such every other vertically-neighboring pel pair, without actually calculating an average amount for any pel pair, but rather merely passing through alternating pel pairs, effectively to reduce computational activity. For example, in this case, particular motion vector values associated with pel pair 217 are selected for further calculation and transferred forward as pel pair 219, but vertically-neighboring pel pair 218 are disregarded and essentially thrown-out for purpose of pixel averaging (Col 8 Ln 12-45).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to integrate motion compensation of Vetro et al with the motion estimation of Jeng et al. The advantage of Jeng et al's motion estimation process is that it improves signal processing performance, pixel averaging and/or omitting scheme is used, particularly to conserve DRAM bandwidth and traffic associated with calculating predictive vector values for complete video screen pel samples.

10. Claims 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro et al (US 7,170,932) in further view of Pearlstein et al (US 6,061,400).

As per claim 49, Vetro discloses a transcoder according to claim 1.

However, Vetro et al does not explicitly teach wherein the downsampler is configured to downsample the prediction error or the decoded image in an adaptively-selectively manner.

In the same field of endeavor, Pearlstein et al teach wherein the downsampler is configured to downsample the prediction error or the decoded image in an adaptively-selectively manner (Col 9 Ln 30-45; the prior art discloses a selective means for prediction means).

Therefore, it would have been obvious for one having skill in the art at the time of the invention with the invention of Vetro et al in view of Pearlstein et al. The advantage is to reduce the effect of prediction errors.

Regarding claim 50, arguments analogous to those presented for claim 49 are applicable for claim 50.

Regarding claim 51, arguments analogous to those presented for claim 49 are applicable for claim 51.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chikaodili E. Anyikire whose telephone number is (571) 270-1445. The examiner can normally be reached on Monday to Friday, 7:30 am to 5 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272 - 7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CEA